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**Parental Bonding and Alexithymia: A Meta-Analysis**

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### **Abstract**

*Aim:* The primary purpose of this meta-analysis was to explore, clarify and report the strength of the relationship between alexithymia, as measured by the Toronto Alexithymia Scale (TAS-20), and parenting style as measured by the Parental Bonding Instrument (PBI).

*Methods:* Web of Science, PsycInfo, PubMed and ProQuest: Dissertations and Theses searches were undertaken, yielding 9 samples with sufficient data to be included in the meta-analysis.

*Results:* Evidence indicated moderate to strong relationships between maternal care and alexithymia, and between maternal care and two of the three TAS-20 alexithymia facets (Difficulties Describing Feelings and Difficulties Identifying Feelings, but not Externally Oriented Thinking). Moderate relationships were observed for both maternal- and paternal-overprotection and alexithymia respectively, and for overprotection (both maternal and paternal) and Difficulties Describing Feelings.

*Conclusion:* This study is the first meta-analysis of the relationship between parenting styles and alexithymia, and findings confirm an especially strong association between maternal care and key elements of alexithymia. This review highlights the issues that still remain to be addressed in exploring the link between parenting style and alexithymia.

*Keywords:* Parental bonding, parenting style, alexithymia, meta-analysis, review, affect dysregulation

## 1. Introduction

Alexithymia is a term used to define a personality trait that involves difficulties identifying feelings, difficulties describing feelings, a paucity of fantasy life and an externally oriented thinking style (1). Ruesch (2) was the first to describe features similar to alexithymia, but it was not until the early 1970s that the psychoanalysts Sifneos and Nemiah reported their clinical observations on patients with classic psychosomatic diseases, which led to the formulation of the alexithymia construct (3, 4). Several models have been proposed regarding the aetiology of alexithymia, with some theorists hypothesising that childhood events such as traumatic experiences and/or a dysfunctional parent-infant relationship contribute to alexithymia (1, 3, 5-7).

Given these hypotheses it is not surprising that several studies have sought to test the relationship between parental bonding and alexithymia. Research in student populations has found a negative association between maternal care and alexithymia as measured by the Toronto Alexithymia Scale (TAS-20) (hereafter called alexithymia), and between maternal care and the alexithymia facet known as Difficulties Describing Feelings (DDF) (7-9). As noted above, DDF is a facet of alexithymia as measured by the Toronto Alexithymia Scale (10, 11). Other research has found negative associations between maternal care and the TAS-20 alexithymia facet known as Difficulties Identifying Feelings (DIF), and positive associations between maternal overprotection and alexithymia, DIF and DDF (12). This general pattern of results has been replicated by others (e.g., 13).

Additional data from clinical samples indicate significant negative associations between maternal and paternal care respectively, and each of the following variables: alexithymia, DIF and DDF (14, 15). Significant positive associations have also been

identified between maternal and paternal overprotection and alexithymia in those with clinical diagnoses (15). In psychiatric outpatients a significant positive relationship between paternal overprotection and alexithymia, as well as a negative relationship between maternal care and DIF, have been documented (16).

Together, these findings suggest that there are differences in maternal and paternal bonding in relation to alexithymia, DIF and DDF across analogue and clinical samples. More specifically, three of the studies among students yielded significant correlations between maternal care, alexithymia and DDF, but no significant associations with DIF, and the third TAS-20 facet known as externally oriented thinking (EOT) or paternal factors (7-9). A slightly different pattern of results emerged in a study by Mason and colleagues (13) with small significant correlations between maternal care, alexithymia and DDF as well as a significant correlation between maternal overprotection and DIF. Kooiman et al. (15) reported significant associations between alexithymia, maternal and paternal care as well as overprotection in a psychiatric sample. By contrast, in another clinical study, only paternal overprotection was associated with alexithymia (16). Thus, the differential impact of maternal and paternal bonding on alexithymia, DIF, DDF and EOT across studies is somewhat unclear. As parental bonding is a core element of early attachment theory hypothesised to be a key risk for alexithymia, a more methodologically rigorous investigation utilising meta-analysis may enhance our understanding of the potential role of paternal and maternal bonding in relation to alexithymia. Furthermore, some evidence has also indicated that optimal parenting in one parent may protect against the development of alexithymia even though the parenting in the other parent is perceived as more pathological (see 15). As meta-analysis permits summary of large amounts of data, this method is capable of

detecting effects of associations that might have been non significant or inconclusive when considered in isolation (17). Increased power may be particularly important in this investigation as small to moderate correlations between parental bonding and alexithymia have been reported in the reviewed research and a meta-analysis may assist in explaining the inconsistencies found across studies (18).

Therefore, the purpose of this review was to integrate and summarise the body of knowledge on parental bonding and alexithymia and investigate possible associations of TAS-20 total alexithymia scores, DIF, DDF and EOT with each of the following subscales of the Parental Bonding Instrument (19): maternal care (MC), maternal overprotection (MO), paternal care (PC), and paternal overprotection (PO).

## **2. Method**

### *2.1. Selection of Studies*

A search of the Web of Science (from 1992 to 2010), PubMed (from 1979 to 2010) and PsycInfo (from 1979 to 2010) was conducted between October 2007 and May 2010. ProQuest was searched (from 1979 to 2010) for dissertations and yielded only one thesis. This dissertation did not examine the association between parental bonding and alexithymia and was thus excluded. To identify relevant studies combinations of key words were used: ‘parental bonding’, ‘parental bonding instrument’, ‘parenting style’, ‘alexithymic’, ‘alexithymia’, ‘alexithymic feature’ and ‘Toronto alexithymia scale’. All obtained research articles in the English language were retained and included studies using the Parental Bonding Instrument and the Toronto Alexithymia Scale (TAS-20). These papers were read and searched for relevant citations. Only studies investigating the association between parental bonding and

alexithymia were included, as the main focus of this meta-analysis was on the relationship between parenting styles and alexithymia. A total of 8 studies with 11 samples were included (see Table 1), but some studies did not report data for all the parental bonding and alexithymia dimensions, thus only 9 samples could be utilised in the meta-analyses. Additional data were obtained for the Mason et al. study (13) by personal communication with Dr. O. Mason. In addition, to minimise publication or post-publication bias (20, 21) relevant researchers were contacted for information from unpublished manuscripts, in-press papers, abstracts, conference presentations and theses regarding the relationship between parental bonding and alexithymia. Table 1 provides a description of sample size, sample type, gender analyses, methodologies and the various parental bonding and alexithymia dimensions examined in each of these 9 studies.

## 2.2. *Measures*

The Parental Bonding Instrument (PBI) (19) draws on attachment theory (22, 23) and factor analytic studies exploring factors associated with recollections of parents' behaviour in childhood (19, 24, 25). The PBI is a 25-item self-report measure, scored on a 4-point Likert scale that assesses the perceived parenting style of the parent toward the child during the first 16 years of life. It consists of two scales, care and overprotection that yield the following subscores: maternal care (MC), maternal overprotection (MO), paternal care (PC), and paternal overprotection (PO). The care scale measures empathy and affection versus hostility and neglect, and the overprotection scale assesses promotion of autonomy versus overcontrol. Parents can be classified into four different styles, 'affectionless control', 'affectionate constraint', 'absent or weak bonding' or

‘optimal bonding’, associated with low or high scores on the two scales. The PBI has acceptable internal consistency and validity (26).

The Toronto Alexithymia Scale (TAS-20) is a 20-item self-report questionnaire designed to assess an individual’s level of alexithymia (10, 11). It yields an overall alexithymia total score (TAS-TS) as well as three distinct subscale dimensions, Difficulty Identifying Feelings (DIF), Difficulty Describing Feelings (DDF) and Externally Oriented Thinking (EOT). The TAS-20 is scored on a 5-point Likert scale with five items being reversed scored. The TAS-20 has shown sound psychometric properties in various samples (27-29).

### **3. Meta-Analytic Procedure**

Meta-analyses were undertaken on 7-9 samples depending on the data available for pooling. Associations of the dimensions of parental bonding (MC, MO, PC, PO) with the alexithymia measures TAS-20 total score (TAS-TS), DIF, DDF and EOT were examined. Correlation effect sizes (30) were calculated by the use of the Comprehensive Meta-analysis program (Biostat, New Jersey, USA). Correlation coefficients, 95% confidence intervals, Z-values and P-values are reported. The analyses were based on the calculated correlation coefficients between parental bonding and alexithymia. Cohen’s (31) convention for interpreting the magnitude of correlation effect sizes was utilised in this study, with a correlation effect size of  $r < .10$  considered small,  $r = .25$  medium and  $r > .40$  large (30).

When undertaking a meta-analysis it is important to consider the issue of heterogeneity to determine whether findings included are consistent (32). Sensitivity analyses were therefore undertaken by comparing the outcomes of the fixed effects



model and the random effects model to check whether the conclusions varied substantially. A comparison of the evidence indicated no significant differences in findings based on the model used for seven of the analyses, but showed significant differences for nine analyses (MC & TAS-TS, DDF; MO & TAS-TS, DIF, DDF & EOT; PC & TAS-TS, DDF) with a wider confidence interval when using the random effects model indicating statistical heterogeneity (33). The use of a fixed effects model in a heterogeneous domain may result in elevated Type 1 error rates (34). Therefore, due to the small number of studies and potential issues with heterogeneity, we used the random effects model for all the analyses (see 33-35). In addition, another type of sensitivity analysis was also undertaken to examine the strength of the results and explore the overall effect of the influence of a small sample size study ( $n = 26$ ) (7) on the current meta-analyses to safeguard for potential bias (36, 37). The results indicated that this particular sample did not change the overall effect of the meta-analyses and was thus included.

Two statistical methods for checking publication bias were used in this study: Funnel plots to assess each study's effect in relation to their sample size and the Rosenthal's fail-safe-N test (38) to calculate the number of unpublished studies required to nullify the observed significant effect of the meta-analysis (21, 36, 37).

## **4. Results**

### *4.1. Maternal factors and alexithymia: the role of maternal care and overprotection*

A series of random model meta-analyses was undertaken to examine the associations between the dimensions of parental bonding and alexithymia (only tables for the TAS-20 total score and parenting styles have been reported, but tables for the

other analyses can be obtained from the corresponding author). Table 2 shows that there was a significant negative association between MC and alexithymia ( $r = -.342$ , 95% CI  $-.410$  to  $-.269$ ,  $P < .0001$ ) indicating a medium to large correlation effect size. The data indicate significant negative associations between MC and DIF with a small to medium correlation effect size ( $r = -.203$ , CI  $-.245$  to  $-.161$ ,  $P < .0001$ ) and between MC and DDF ( $r = -.397$ , CI  $-.479$  to  $-.309$ ,  $P < .0001$ ) with a medium to large correlation effect size. The association between MC and EOT was also significant ( $r = -.100$ , CI  $-.145$  to  $-.056$ ,  $P < .0001$ ), indicating a small correlation effect size. The sensitivity analyses presented earlier indicated that the overall correlation effect size for the associations between MC, alexithymia and DDF were heterogeneous. Given these findings a Q-statistic test was conducted to explore the impact of dispersion on the overall correlation effect size. A significance level of 0.10 was utilised for all the heterogeneity analyses to avoid Type II error because of the low power of this type of test (33). The calculation showed significant levels of heterogeneity for the MC and TAS-TS ( $Q = 23.57$ ,  $P < .003$ ) and MC and DDF ( $Q = 30.22$ ,  $P < .0001$ ) variables.

I-squared statistic calculations quantify the percentage of variability between studies (see 39). A calculation of the I-squared statistic in the current investigation indicated that 66 % (MC & TAS-TS) and 77 % (MC & DDF) of the variance between studies in these meta-analyses were associated with real differences in the overall correlational effect sizes. Publication bias was investigated by the use of Funnel plots indicating no potential publication bias for maternal and paternal factors in alexithymia. Furthermore, a file-drawer analysis (38) was undertaken indicating that there would have to be over 540 (MC & TAS-TS) non-significant unpublished studies for the overall effect of the above analysis to become non-significant ( $P > .05$ ). This is

consistent with a lack of publication bias. Table 3 shows that there was a significant association between MO and alexithymia ( $r = .178$ , 95% CI .114-.240,  $P < .0001$ ) indicating a small to medium correlation effect size. There were also significant associations between MO and DIF ( $r = .186$ , CI .131-.239,  $P < .0001$ ) and between MO and DDF ( $r = .269$ , CI .127-.400,  $P < .0001$ ) indicating small to medium correlation effect sizes. There was no significant association between MO and EOT ( $r = -.031$ , CI -.082-.020,  $P > .05$ ). A calculation of the Q-statistic and I-squared statistic showed significant levels of heterogeneity for MO and TAS-TS ( $Q = 14.83$ ,  $P < .062$ ) with 46 % of the overall effect attributed to between study variance, and MO and DDF ( $Q = 66.35$ ,  $P < .0001$ ) with 89 % of the overall effect associated with real differences in correlation effect size between investigations. Publication bias was assessed by the use of the Rosenthal's fail-safe-N test (38) and indicated that there would have to be 120 (MO & TAS-TS) unpublished non-significant studies ( $P > .05$ ) to nullify the overall correlation effect sizes of these analyses.

#### *4.2. Paternal factors and alexithymia: the role of paternal care and overprotection*

Table 4 shows that there was a barely significant association between PC and alexithymia ( $r = -.068$ , CI -.134 to -.002,  $P < .044$ ) with a small correlation effect size. There were no significant associations between PC and DIF ( $r = -.049$ , CI -.116-.018,  $P > .05$ ), PC and DDF ( $r = -.057$ , CI -.126 to -.012,  $P > .05$ ) or between PC and EOT ( $r = -.018$ , CI -.068-.032,  $P > .05$ ). The Q-statistic analysis of heterogeneity found no dispersion between the correlation effect sizes for these analyses, indicating homogeneity between studies. A file-drawer analysis indicated that only 8 studies were needed to nullify the overall effect ( $P > .05$ ).

Table 5 shows a significant association between PO and alexithymia ( $r = .131$ , CI .085-.176,  $P < .0001$ ) indicating a small correlation effect size. Furthermore associations between PO and DIF ( $r = .086$ , CI .038-.135,  $P < .001$ ) and PO and DDF ( $r = -.094$ , CI .044-.143,  $P < .0001$ ) were significant, but the correlation effect sizes were small. The association between PO and EOT was not significant ( $r = .023$ , CI -.027-.073,  $P > .05$ ). The calculation of the Q-statistic for the above analyses indicated no heterogeneity. The Rosenthal's fail-safe-N test (38) suggested that there would have to be 57 unpublished non-significant studies ( $P > .05$ ) to nullify the overall correlation effect sizes of this analysis.

## 5. Discussion

This paper examined the role of maternal and paternal factors on alexithymia, and of the four parental bonding factors examined, the strongest and most consistent pattern of associations involved maternal factors. The current meta-analyses confirmed a moderate relationship between MC and alexithymia, and two of the alexithymia facets (DDF and DIF). MC showed only a small correlation effect size with EOT. MO was positively associated with alexithymia as well as with DDF and DIF, and these associations had small to medium correlation effect sizes. MO was not significantly associated with EOT.

The findings of the present meta-analysis suggest that a lack of perceived maternal care and nurturing, and perceptions of neglect, overprotection and intrusive parenting are associated with alexithymia and the facets that relate to feelings, but not thinking (EOT). Parenting characterized by low care and high overprotection has been described as 'affectionless control' and is considered the most pathogenic of the

parenting styles (19). Perceived low maternal care may be experienced as a lack of emotional sensitivity to childhood needs, which may manifest in adulthood as alexithymia, and in particular, difficulties identifying and describing feelings. This is in line with early attachment theory proposing that the bonding with a significant caregiver is essential for the development of internal working models for communication, regulation of emotions and interpersonal functioning (40, 41) as well as clinical observations proposing that childhood trauma may have an impact on the development of alexithymia (42). Alternatively, alexithymia may be associated with perceived lack of emotional expression by the caregiver/parent, and not necessarily with early childhood trauma or poor parenting style per se (15).

Some evidence indicates that maternal alexithymia is associated with alexithymic features in the child (43). However, an alexithymic child may predispose a parent to act in certain ways (i.e. reduced care or excessive protection) because the child does not adequately respond to, or recognise, the parent's emotionality. It is also likely that other genetic and socio-cultural contributions affect the development of alexithymia (1, 44, 45). Given the complexity of these associations we recommend further research to explore the mechanisms of learning about emotions from attachment figures.

Maternal factors (MC and MO) were not, or were only weakly, associated with EOT. This contrasts with the results reported above, which showed that the two other alexithymia dimensions were at least moderately associated with maternal factors. Cautious interpretation is warranted here because of the relatively weak psychometric properties of the EOT subscale. Fukunishi et al. (46) reported that the alpha coefficient of the EOT factor was 0.49 in their study. This may be associated with culturally specific elements, e.g., the expression of aggression or hostility that is not considered

appropriate or desirable within Japanese culture, and previous evidence that has indicated a link between repression of emotions and alexithymia (47, 48). Given that the EOT scale may not encompass cultural differences effectively, or alternatively be influenced by response bias associated with the negatively keyed items (27, 49), future research may benefit from a revision of the EOT scale in order to improve reliability. The current meta-analyses found a barely significant negative relationship between PC and alexithymia, and no significant relationships with DIF, DDF or EOT. However, PO was significantly associated with alexithymia, DIF and DDF with small correlation effect sizes, but was not associated with EOT.

Thus, the present meta-analytic findings indicated that fathers perceived parenting style may have a minimal impact on alexithymia and its dimensions compared to that of mothers. Overall, these results are mostly in agreement with studies in student samples (7-9), but not in clinical samples where fathers parenting styles seem to have more of an impact on alexithymia, DIF and DDF. More specifically, in a mixed eating disorder and community sample positive associations between PC, alexithymia, DIF and DDF were evident (14) and PC was associated with alexithymia among psychiatric outpatients (15). Similarly, a study in a clinical sample using a modified version of the Parental Bonding Instrument; the Measure of Parental Style (50), Pedrosa et al. (51) found that paternal abuse and indifference were significantly associated with DIF. These findings indicate that paternal attachment may still be important, at least in clinical samples. Other paternal bonding research not including alexithymia has found that PO was significantly related to psychosomatic illness (52) and that low PC and high PO was associated with dysfunctional coping such as repression (53) as well as with anxiety and depressive symptoms (54, 55). These results suggest that paternal bonding may be

more important in relation to dysfunctional coping and negative affect than in relation to alexithymia and difficulties identifying and describing feelings. Still, as described in the introduction, one study (15) found in a clinical sample that an optimal parenting style in one parent buffered the effect on alexithymia, suggesting that further research is needed to explore the combined effects of maternal and paternal parenting style on alexithymia. In addition, Kooimann et al. (15) did not investigate the alexithymia dimensions of DDF, DIF and EOT in relation to parenting style and thus, further research is needed.

The findings of the present meta-analysis have important implications for parenting programs as well as clinical practice. Given that perceived early maternal attachment may be associated with the development of DDF, alexithymia and DIF, caregivers should be educated about the importance of appropriate ways to respond to meet the emotional needs of their infants in early childhood in order to avoid the development of difficulties in understanding feelings, dysfunctional affect regulation and emotional processing. Secondly, previous research has shown that alexithymia is highly prevalent in individuals with psychosomatic and physical illness as well as psychological disorders (1). Given these relationships it may be important to have a strong focus on developing a secure treatment alliance when conducting clinical interventions where attention should be focused on establishing a secure and safe environment where the client can start to develop a capacity to express emotions verbally, which in turn may improve the ability to identify and describe feelings.

Some limitations need to be taken into consideration when evaluating the present results. People with alexithymia lack self-reflective capacity and emotional insight (5, 56, 57), hence the validity of measuring alexithymia by self-report may be questioned. Future research should ideally combine the TAS-20 with an observer measure of

alexithymia to assess potential discrepancies (58, 59). Interpreting items on the care scale of the PBI may also have been difficult for people with alexithymia, as the care scale asks subjects to rate the degree of statements such as “Was affectionate to me” or “Spoke to me in a warm and friendly voice”. As the PBI is a retrospective measure assessing perceived parenting style during the first 16 years of life, responses are susceptible to inaccurate or incomplete recollection. Together, these issues may also at least partly explain the significant heterogeneity in the analyses of TAS-TS, MC, MO and DDF.

In conclusion, the present meta-analysis found moderate relationships between MC and alexithymia, DDF, and DIF. A lesser association was evident between MO and alexithymia. Paternal care and overprotection may also be associated with DDF and alexithymia. These findings highlight the importance of utilising an attachment theoretical framework in alexithymia research and suggest that parenting styles may be an important factor in the aetiology and development of alexithymia. In order to further understand the relationships identified in this analysis, and in particular, to test for the presence of causal relationships further research that examines parental bonding and alexithymia utilising a longitudinal design is strongly recommended.

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Table 1. Description of studies identified examining parenting style and alexithymia

Author, year	Sample Type	Sample Size Female Male		Gender Analysis	Methodology	Alexithymia & Parental Bonding Variables Examined
Mason et al., 2005	Student	190	181	Separate & Combined	Cross-Sectional	TAS-TS, DIF, DDF, EOT, Care & Over
Kooiman et al., 2004	Clinical-Ps	85	63	Combined	Cross-Sectional	TAS-TS & MC, MO, PC, PO
De Panfilis et al., 2003	Clinical- ED Control	64 68		Female Only	Cross-Sectional	TAS-TS, DIF, DDF, EOT & MC, MO, PC, PO, Mean C & Mean O
Fukunishi & Paris, 2001	Student	Total 230*		Combined	Cross-Sectional	TAS-TS, DIF, DDF, EOT & MC, MO, PC, PO
Fukunishi et al., 1999 (Study 1)	Student	90	111	Combined	Cross-Sectional	TAS-TS, DIF, DDF, EOT & MC, MO, PC, PO
Fukunishi et al., 1999 (Study2)	Student		26	Male Only	Cross-Sectional (Laboratory)	TAS-TS, DIF, DDF, EOT & MC, MO, PC, PO
Fukunishi., 1998	Student	278	302	Combined	Cross-Sectional	TAS-TS, DIF, DDF, EOT & MC, MO, PC, PO
Kooiman et al., 1998	Clinical-Axis I	46	32	Combined	Cross-Sectional	TAS-TS, DIF, DDF, EOT & MC, MO, PC, PO
Fukunishi et al., 1997 (Study 1)	Student	103	129	Combined	Cross-Sectional	TAS-TS, DIF, DDF, EOT & MC, MO, PC, PO
Fukunishi et al., 1997 (Study 2)	Student	84	72	Combined	Cross-Sectional	TAS-TS, DIF, DDF, EOT & MC, MO, PC, PO

Care= Care subscale of the PBI, DDF=Difficulties Describing Feelings, DIF=Difficulties Identifying Feelings, ED=Eating Disorder, EOT=Externally Oriented Thinking, MC=Maternal Care, Mean C=Mean care, Mean O=Mean Overprotection, MO=Maternal Overprotection, Over=Overprotection subscale of the PBI, PBI= Parental Bonding Instrument, PC=Paternal Overprotection, PO=Paternal Overprotection, Ps=Psychiatric Outpatients, TAS=Toronto Alexithymia Scale & TAS-TS= Toronto Alexithymia Scale-Total Score.

\*This study included an additional 2 samples not included in the present meta-analyses. Thus, all samples included reported the perceived parental bonding of the individuals' parents. Gender data were not reported for the included sample.



Table 2 The association between maternal care and alexithymia

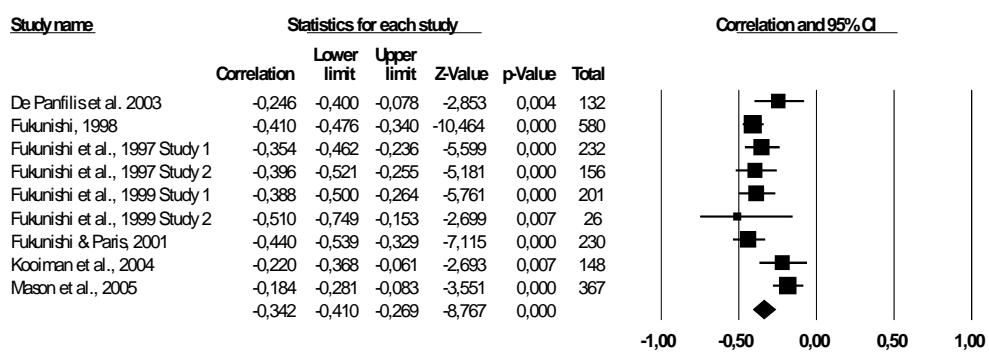


Table 3 The association between maternal overprotection and alexithymia

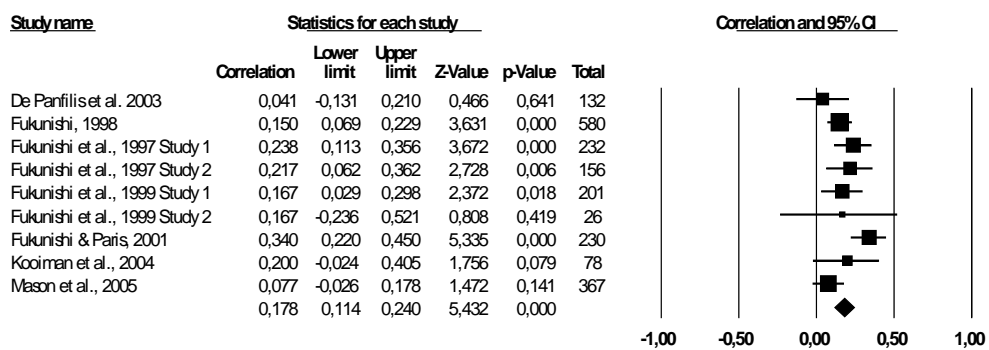


Table 4 The association between paternal care and alexithymia

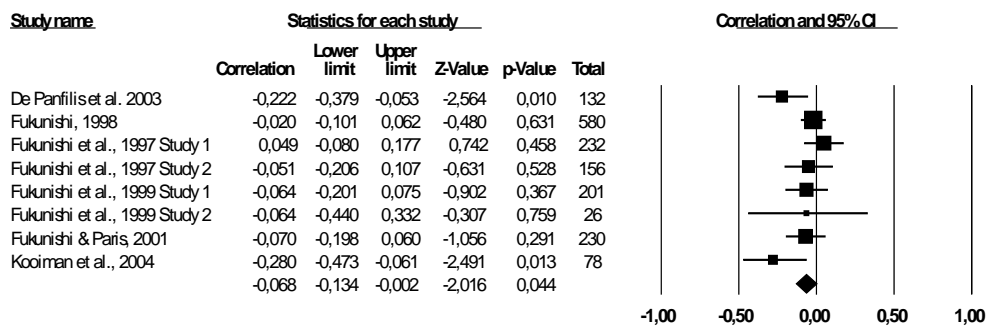


Table 5 The association between paternal overprotection and alexithymia

